学位申請者：Wang Wei

論文題目：Study of beta decay of 48Ca

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論文要旨：

Precise studies about lifetime of the β decay of 48Ca are necessary because the β decay could be substantial background for double beta decay spectrum of CANDLES (CAlcium fluoride for studies of Neutrino and Dark matters by Low Energy Spectrometer) experiment. The principle of this experiment was based on coincidence measurement of 3 gamma rays from concentrated 48Sc - the β decay product of 48Ca. We used 30 CsI(Tl) scintillators to cover (4π solid angle) the sample space with 133 cm3. In order to increase the amount of 48Ca, we enriched the 48Sc using the chelate resin called NOBIAS-CHELATE-PA1 from CaCl2 solution that contained 255.1Kg CaCl2 powder. The live-time of the measurement was 70.7 days. The half-life time of β decay of 48Ca that we got was T1/2(β) =(2.2 $\pm$ 0.6[statistic] $\pm$ 0.1[systematics]) $\times$1021 y with 95% C. L. The half-life time is the longest for all known β- transition. For CANDLES experiment, the background contribution from β decay for $2\nu\beta\beta$ above 3MeV spectrum is less than 1.9(2)% and has no contribution for $0\nu\beta\beta$ research.